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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/641,742	08/18/2000	Samuel J. Danishefsky	2003080-0054	7338

63411 7590 11/20/2006

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EXAMINER

CANELLA, KAREN A

ART UNIT PAPER NUMBER

1643

DATE MAILED: 11/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/641,742

Applicant(s)

DANISHEFSKY ET AL

Examiner

Karen A. Canella

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 56,58-62,65-67,69-76,78-81,84-86 and 88-98 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 56,58-62,65-67,69-73,76,78-81,84,86,88-92,95 and 98 is/are rejected.
- 7) ☐ Claim(s) 74, 75, 85, 93, 94 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 23, 2006 has been entered.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 56, 61, 62, 67, 74, 76, 81 and 93 have been amended. Claims 56, 58-62, 65-67, 69-76, 78-81, 84-86, 88-98. are pending and under consideration.

Claims 56, 58-62, 65-67, 69-73, 76, 78-81, 84, 86, 88-92, 95 and 98 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a multiantigenic glycopeptide comprising the structures of Globo-H, fucosyl GM1, KH-1, glycophorin, STN, Ley, N3, Tn, 2,6Tn, 2,3ST or TF, does not reasonably provide enablement for the multitude of variant structures encompassed by the differing "R" substituents as listed in claims 56, 62, 76, 81. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The instant specification provides for the synthesis of multiantigenic-carbohydrate antigens, such as those in cancer cells, on a peptide backbone. The specification teach that these carbohydrate domains are useful in evoking an immune response in cancer patients. The specification provides no teachings as to how to use a glycopeptide construct that is not a domain which would evoke a efficacious immune response in a patient. The specification does not identify an antigenic structure that comprises "F", or a pattern of ring substituents having R groups that differ from the R groups on carbohydrates found on cancer cells. Further, the specification does not teach how to synthesize the molecules which are not the carbohydrate domains of Globo-H, fucosyl GM1, KH-1, glycophorin, STN, Ley, N3, Tn, 2,6Tn, 2,3ST or TF.

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There is no nexus between the synthesis of the aforesaid molecules and the synthetic approach to an antigen structure that differs in the number of pyranose rings, and the substitution pattern on the pyranose rings because the Globo-H, fucosyl GM1, KH-1, glycophorin, STN, Ley, N3, Tn, 2,6Tn, 2,3ST or TF molecules are complex and governed by a multitude of physical interactions based on the accumulation and positioning of the various electron withdrawing groups of the substituents encompassed by the claims. The presence of differing functional groups, heteroatoms, such as Fluorine in the instant case, and three dimensional configurations require different considerations as to protecting groups, and reactivity manifest in different synthetic strategies (Sierra and de la Torre, *Angewandte Chemie*, 2000, Vol. 39, pp. 1538-1559, especially pages 1544-1546, "Troublesome Protecting Groups"). Chemical structure heterogeneity including the presence of different heteroatoms or aryl groups on different three dimensional structures can radically alter the reactivity of any other atom within a molecule through inductive effects (page 1545, second column, lines 2-6 of the second full paragraph and lines 4-7 of the third full paragraph), resonance effects, acidity, basicity, steric hindrance (page 1552-1554), strain (page 1554-1557) or transition state crowding (page 1545, second column, second full paragraph, lines 2-6, page 1546, second column, first full paragraph) and therefore can radically influence the reactivity with any given reagent contacted thereto. Sierra and de la Torre teach that a well-testing transformation can fail for complex reasons (Sierra and de la Torre, *ibid*, page 1540, first column, lines 9-11, page 1541, first column, lines 33-37, under the heading "Working Models that do not Work", page 1542, first column, lines 15-17, even when supported by molecular mechanics calculations (page 1542, first column, lines 6-9) and what is seen as an innocuous alteration can cause a failure in a synthetic step (page 1542, second column, lines 9-12). Sierra and de la Torre teach that the presence of remote substitutions has unexpected influence over a chemical step (pages 1546-1548, under the heading "The Unexpected Influence of Remote Substituents") Sierra and de la Torre state that "As the complexity of intermediates increases, the number of variables involved in a simple transformation grow exponentially making predictions about the outcome of any given synthetic step on a highly functionalized intermediate, unreliable (page 1548, second column, lines 5-8 of the second full paragraph, page 1550, second column, lines 1-9 under the heading "The Trivial Functional Group Transformation"). Sierra and de la Torre conclude that the lack of predictability in so many

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cases and the very empirical nature of synthetic organic chemistry implies that the science is not fully developed (page 1548, second column, lines 13-16 of the second full paragraph). Sierra and de la Torre state that alternate routes can then be devised which circumvent a failed transformation (page 1548, second column, lines 10-13 of the second full paragraph). However, the sum total effort of designing and redesigning represents undue experimentation to one of skill in the art, exemplified by Sierra and de la Torre as "the amount of effort devoted to simple transformations is still quite enormous" (page 1557, first column, lines 15-18). It is noted that the multiantigenic glycopeptides encompassed by the claims are densely multifunctionalized agents. Thus, the specification teaches how to make glycopeptides comprising Globo-H, fucosyl GM1, KH-1, glycophorin, STN, Ley, N3, Tn, 2,6Tn, 2,3ST or TF, but the scope of the instant claims comprises a greater degree of variance with respect to the carbohydrate moieties and the means to make such moieties and the means to use said moieties are unknown. therefore one of skill in the art would be subject to undue experimentation in order to make and use the structures within the scope of the claims.

All other rejections and rejection are withdrawn in light of applicants amendments.

Claims 74, 74, 85, 93 and 94 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karen A. Canella whose telephone number is (571)272-0828. The examiner can normally be reached on 10-6:30 M-F.

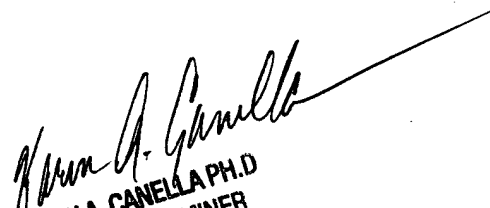
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Helms can be reached on (571)272-0832. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Karen A. Canella, Ph.D.

11/12/2006


KAREN A. CANELLA PH.D.
PRIMARY EXAMINER